More Chapter 15 & 16 Study Questions

1. Find the ratio of $C_3H_5O_2^-$ / $HC_3H_5O_2$ (propanoate/propanoic acid) in a buffered solution at pH 5.00.

2. Find the pH of the following mixture: 100. mL 0.100 M H_3BO_3 mixed with 150. mL 0.100 M NaH_2BO_3.

3. What is the solubility of sodium sulfate in 0.10 M strontium nitrate? (Or, what is the minimum concentration of sodium sulfate that would cause a a precipitate with 0.10 M strontium nitrate?)

4. The solubility of $Pb(IO_3)_2(s)$ in a 0.10 M KIO_3 solution is 2.6 x 10^{-11} mol/L. Calculate K_{sp} for $Pb(IO_3)_2(s)$.

5. The K_{sp} for lead iodide (PbI_2) is 1.4 x 10^{-8}. Calculate the solubility of lead iodide in 0.010 M NaI.

6. Find $[PbCl_2]$ in a saturated solution of $PbCl_2$. $K_{sp} = 1.7$ x 10^{-5}.

7. Lead nitrate ($Pb(NO_3)_2$) is added to 0.010 M NaCl. Find the concentration of $Pb(NO_3)_2$ when a precipitate forms.

8. Use this Table as needed for the following questions:

indicator	Color (HIn)	Color (In⁻)	K_a
cresol red	red	yellow	1 x 10^{-1}
methyl yellow	red	yellow	1 x 10^{-3}
cresol purple	yellow	purple	1 x 10^{-8}

   a) What color is a solution of 0.10 M NaOH when 1 drop of methyl yellow is added?
   b) What color is a solution of 0.10 M NaOH when 1 drop of cresol purple is added?
   c) At what pH is cresol red, orange in color?
   d) A solution is yellow when both methyl yellow and cresol purple are added. Give a pH range for this solution.

9. A 0.290 gram sample of a weak base is titrated with a 0.150 M HCl solution. It takes 28.0 mL of the 0.150 M HCl solution to neutralize the weak base.
   a) How many moles of base are in the sample?
   b) What is the molar mass of the weak base?

10. It takes 2.50 mL of 3.00 M NaOH to neutralize 0.750 L of an HCl solution.
    a) What is the concentration of the HCl solution?
    b) What is the pH of the HCl solution?